

UNITED STATES AIR FORCE
ELMENDORF AIR FORCE BASE, ALASKA



**Nomination for the
FY1999
Secretary of Defense Environmental Security Award
Environmental Cleanup
Installation/Civil Works Facilities**

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SECRETARY OF DEFENSE ENVIRONMENTAL SECURITY AWARD

ENVIRONMENTAL CLEANUP INSTALLATION/CIVIL WORKS FACILITIES

ELMENDORF AIR FORCE BASE, ALASKA

INTRODUCTION

The 3rd Wing is located at Elmendorf Air Force Base, Alaska, and is a component of the Pacific Air Forces (PACAF). The mission of the 3rd Wing is to train and equip an Air Expeditionary Force lead wing comprised of 6,900 personnel. With proximity and access to Asia, Europe, and North America, Elmendorf's strategic location yields significant importance to global military operations. The installation's location is ideal for deploying aircraft, troops, and equipment around the world, and air defense and superiority are achieved through the wing's F-15C/D Eagle, F-15E Strike Eagle, and other support aircraft. Elmendorf provides medical care for all military forces in Alaska and hosts the Eleventh Air Force Headquarters, associate units, and tenants.



Elmendorf contains 13,103 acres of land, including approximately 1,592 acres of wetlands. Developed areas include operations (runways, taxiways, and maintenance buildings), base support operations, housing, and recreational facilities. Elmendorf employs about 8,445 people, currently comprised of approximately 20 percent Department of Defense (DoD) civilians, with the remainder being military personnel. About 6,077 people reside on the installation.



Location of Elmendorf AFB, Alaska

Elmendorf is located immediately north of the Municipality of Anchorage, the largest city in Alaska, with a population of 258,000. Elmendorf is as far north as Helsinki, Finland, and as far west as Honolulu, Hawaii. Average summer temperatures range from 52 to 65 degrees F, and winter temperatures vary from 7 to 22 degrees F. Due to Elmendorf's northern latitude, daylight peaks at 19.3 hours in summer; conversely, midwinter days see fewer than 6 hours of daylight.

Elmendorf is bound on the west and north by the Knik Arm of Cook Inlet and on the east by the U.S. Army, Fort Richardson. Ship Creek, on the southern boundary of the base, is an ecologically sensitive urban stream supporting a premier salmon fishery. Elmendorf occupies a unique position as a

wildlife habitat preserve situated in the middle of Alaska's major metropolitan area. Through an aggressively applied natural resources program, the base supports healthy populations of moose, brown and black bears, bald eagles, wolves, and five species of Pacific salmon. The beluga whale, a proposed depleted species, inhabits the marine waters adjacent to Elmendorf. A close,



Ship Creek's salmon fishery attracts thousands of residents and tourists each summer. Anchorage Convention and Visitors Bureau photo by Harry Walker

cooperative working relationship with the Alaska Department of Fish and Game has aided the base in gaining recognition throughout the state as a premier wildlife management and conservation program.

BACKGROUND

Elmendorf's restoration team is comprised of highly skilled and motivated individuals from the base, Environmental Protection Agency (EPA), and Alaska Department of Environmental Conservation (ADEC). The restoration team relies heavily on advice from the community, Restoration Advisory Board (RAB)

members, and native tribes to formulate cleanup plans and decisions. Program and project management for restoration activities is the responsibility of the Environmental Flight within the 3rd Civil Engineer Squadron. The flight has six personnel dedicated to planning and executing the Environmental Restoration Program. In addition, other members of the base restoration team include experts from 3rd Wing Public Affairs and Eleventh Air Force Judge Advocate's Office.

Contaminated sites on Elmendorf are similar to those found on a typical light industrial Air Force base. These sites range from old World War II (WWII) landfills, historical fuel spills and pipeline leaks, to waste disposal trenches dug outside base maintenance shops. Polychlorinated biphenyls (PCB) transformer storage areas and pesticide and asphalt disposal sites also challenged the restoration team. Currently there are 84 contaminated sites on Elmendorf.



Aerial Photograph of Elmendorf AFB. Courtesy of Aeromap, Inc

The EPA placed Elmendorf on the National Priorities List (NPL) in August 1990, and the base signed a Federal Facilities Agreement (FFA) with the EPA and the ADEC in November 1991. The FFA covers 39 individual sites, grouped into six operable units, being cleaned up under the

“Elmendorf is one of the better federal facilities I have worked on and the project managers are the key to their success.”

-- Louis Howard, Project Manager,
ADEC

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). To date, records of decision and remedial action completion reports have been completed and signed for all six operable units. In November 1998, Elmendorf's restoration team completed its first five-year remedy review and concluded all remedies continued to be protective of human health and the environment.

Elmendorf also signed the State-Elmendorf Environmental Restoration Agreement (SERA) with ADEC in October 1992. Thirty-nine source areas were designated as state program sites, and remedial activities are being performed under the SERA. All treatment systems have been constructed and installed at the state program sites.

Elmendorf's geology consists of glacial and related deposits including terminal moraines, ground moraines, and glacial outwash plains. This geology poses unique challenges in determining the extent of contamination on base. The most distinctive landform is the Elmendorf Moraine, a southwest-northeast trending terminal moraine. The moraine consists of horizontally and vertically discontinuous, unconsolidated glacial till with poorly sorted boulders, gravel, sand, and silt deposits. Finer-grained clay lens deposits are found throughout the moraine and may result in zones of perched groundwater.

South of the Elmendorf Moraine lies the glacial outwash plain alluvium. The alluvium deposits were formed by a series of coalescing streams resulting from glacial meltwater. These outwash plain deposits consist of unconsolidated fine- to medium-grained, poorly sorted sand and gravel. Most of the developed areas on the base are built in the outwash plain alluvium, and more than 90 percent of the contaminated sites are located in this area.

Two principal groundwater aquifers have been identified in the glacial outwash plain alluvium and on the Elmendorf Moraine. These aquifers include a shallow unconfined aquifer and a deeper confined aquifer. The Bootlegger Cove formation acts as the confining layer, or barrier, between the shallow and deep aquifers. Since 1991, Elmendorf has undertaken an aggressive approach to understand regional groundwater characteristics and has conducted intensive groundwater monitoring. These efforts confirm the extent of contamination in the shallow aquifer. The deeper confined aquifer and Ship Creek have not been impacted by any contaminants from sources on Elmendorf.

PROGRAM SUMMARY

The restoration team is constantly evaluating and updating cleanup strategies to ensure program goals and objectives are exceeded. Since Elmendorf was listed on the NPL in August 1990, the

restoration team has undertaken an aggressive approach toward cleaning up contaminated sites. Goals and objectives for fiscal year (FY) 1998 and FY1999 included:

- Complete comprehensive five-year remedy review without contractor support
- Complete all remedial action completion reports
- Remove PCB-contaminated soils to allow closure of Operable Unit 3
- Remove 11,000 linear feet of abandoned pipeline damaged during the devastating 9.2 magnitude earthquake of 1964
- Complete site investigations of newly discovered areas of concern
- Evaluate and optimize the efficiency of a state-of-the-art high-vacuum extraction system
- Achieve early shutdown of groundwater pump and treat system
- Continue operation of bioventing systems and develop early shutdown procedures
- Facilitate the use of restoration remedies to develop a presumptive remedy approach for groundwater cleanup of future spills
- Expand community outreach to include government-to-government coordination with Alaska Natives
- Improve base civil engineer work request process to ensure compliance with institutional controls

By FY1999, 97 percent of the 84 contaminated sites had either final remediation systems in place and operating or cleanup activities were complete. Partnering with stakeholders and creative approaches to tackling complex cleanup issues has positioned Elmendorf to complete construction and installation of treatment systems at all sites by November 2005, a full nine years before the DoD's goal of FY2014. These are remarkable feats for a 13,000-acre base located in a harsh sub-arctic environment, hampered by the short Alaskan construction season.

ACCOMPLISHMENTS

Elmendorf is considered the environmental leader within the Pacific Air Forces (PACAF) Command. Other PACAF bases routinely call Elmendorf for assistance in resolving cleanup issues. Elmendorf has won the PACAF Environmental Restoration Award five times since 1993, consecutively for the last three years. In 1993 and 1999, we successfully competed and won the Air Force's General Thomas D. White Restoration Award. Elmendorf's Community Relation Program received a merit award from the National Association of Professional Environmental Communicators in 1994. The Elmendorf Restoration Advisory Board was presented with the Pentagon Crystal Award in 1997. The ST37 wetland treatment system received the coveted Commander-in-Chief's Special Recognition for Installation Excellence in 1998. Elmendorf earned the prestigious 1998 Air Force Public Affairs Director's Excellence

"We have always looked to Elmendorf's invaluable expertise in the Environmental Restoration Program to help us solve some of our most difficult clean-up challenges. They have and will always be recognized as the leader in the Pacific Region"

-- William L. Barry, Chief, Environmental Restoration, 15th Air Base Wing, Hickam AFB.

Award for Community Involvement in Environmental Planning and is again in contention for this award in 1999. As a showcase base for restoration, Elmendorf was selected as an outstanding site to host the International Arctic Military Environmental Cooperation Meeting in October 1997.

[Comprehensive Five-Year Remedy Review](#)

In October 1998, the restoration team completed the first five-year remedy review of the restoration activities on base, using only in-house resources. The purpose of this review was to perform a comprehensive in-depth evaluation of all environmental cleanup actions to ensure activities remained protective of human health and the environment. Early in the review process, the restoration team recognized the importance of public and RAB involvement. Although not required, the restoration team developed a strategy to publicize the five-year remedy review. The draft document was shared with the RAB, and members expressed confidence in the conclusions of the draft report. Fact sheets at the draft and final stages were distributed to more than 660 stakeholders. News releases and paid notices were issued that sought public comment on the five-year remedy review. This eight-month comprehensive review concluded all cleanup activities on Elmendorf continue to be protective of human health and the environment.

[Remedial Action Completion Reports](#)

As a step towards achieving the goal of “construction complete,” the restoration team accomplished remedial action completion reports for all operable units. These reports evaluated treatment systems installed at six operable units to ensure each system was functioning as designed and in compliance with the requirements outlined in the record of decision (ROD). Five of six remedial action completion reports were prepared simultaneously with the five-year review. The last report, for Operable Unit 3, was completed in May 1999. Completion of these reports is one of the first steps in the long road to delisting from the NPL.

[Areas of Concern](#)

To ensure that all contaminated sites have been found, in 1998 the restoration team conducted one last search of the base. A review of historical aerial photographs from the 1950s through 1990s for land use changes was instrumental in identifying areas of concern warranting further investigation. A ground survey was done at sites showing distressed vegetation, stained soil, and evidence of past operations. This search discovered two new sites in remote locations of the base. Ongoing investigations are underway. Our proactive review sets the stage for all treatment systems to be in place by FY2005.

[Abandoned Pipeline Removal](#)

Eleven thousand feet of abandoned WWII pipeline, damaged during the 1964 earthquake, was removed in 1998 at a cost of \$1.3 million. This pipeline once served as the primary fuel line from the Port of Anchorage to the base’s tank farm. During the pipeline removal, contaminated soil was delineated and excavated from the pipeline corridor, then thermally remediated. This removal project and mapping process eliminated the future requirement for intensive and costly

remedial investigation/feasibility studies and treatment systems, allowed for the timely closure of the site, and saved more than \$2.2 million. Our savings in cleanup costs supports the Air Force mission by allowing these dollars to be reinvested in the cleanup of other bases.

LF04 Beach Sweeps

Each summer since 1997, the restoration team has conducted beach sweeps to remove landfill debris. This challenging effort is conducted on the beach below a Vietnam-era landfill known as LF04. LF04 is situated on a bluff overlooking the Knik Arm of the Cook Inlet. The landfill is vulnerable to Cook Inlet's extreme tidal action, which, with a range of 38.9 feet, has the second highest tides in the world. Over the years, the severe erosion has caused the landfill to be undercut and the debris to slide down the bluff and wash into marine waters.



Annual beach sweeps at LF04 landfill

Debris accumulates on the beach where it is collected and disposed of annually, in accordance with the ROD. To date, approximately 214 tons of landfill debris have been removed. The



Sea ice on beach at LF04 landfill

ongoing beach sweeps afford many unique challenges including mudflats that bog down equipment and people, fast-moving extreme tides, historic native fish camps/suspected burial sites, and the congested ship traffic at the Port of Anchorage. The site is being reevaluated to find a more effective solution to this unique problem exacerbated by the winter sea ice and large variation in tides.

Innovative Technology Demonstration/Validation and Implementation

ST37 Wetland System

In FY1997, Elmendorf completed construction and began operation of a truly unique engineered wetland system -- the “centerpiece” of the base’s groundwater cleanup strategy. Successful partnering with the community, Alaska Railroad Corporation, and regulatory agencies secured the optimum location for the system, efforts which saved millions of dollars in construction costs. The wetland complex was designed to capture and treat groundwater seeps contaminated with benzene and other solvents. Studies have shown that approximately 90 percent of the groundwater flow on the base is treated through the engineered wetland. The design capacity also has the ability to treat additional groundwater contamination in the event of future spills -- a “safety net” for any upgradient spills.



ST37 Engineered Wetland Complex

The wetland uses naturally-occurring organisms and well-established principles of microbiology to achieve significant reductions in contaminants. The reductions are significant enough to allow the discharge of groundwater from the base to sensitive ecological habitats such as Ship Creek without additional treatment. The operational concept for the engineered wetland project came from studies of an upstream natural beaver pond wetland and its incredible ability to clean up contaminants.

This innovative wetland complex captures and treats contaminated groundwater at one-fifth of the cost of traditional and conventional “pump and treat” systems. This system effectively processes over 129,000 gallons of water per day and, to date, has successfully treated over 123 million gallons of water to above cleanup levels. Because of the amount of groundwater required to be treated on a daily basis, a conventional

“pump and treat” system would have required construction of a city-sized water treatment facility and permanent manpower assigned for operation. The engineered wetland system currently operates at a minimal cost of \$203,000 per year (35 cents per 100 gallons of water treated), with minimal manpower requirements.

This wetland treatment system has become an international showcase for innovative technology to treat contaminated groundwater, including the ability to operate efficiently in harsh sub-arctic conditions. This system has applications worldwide. Distinguished visitors from around the world have toured the facility, including senior military leaders from DoD, Air Staff, Norway, and Russia.

SD15 High-Vacuum Extraction (HVE) System

High-vacuum extraction, a state-of-the-art technology, was selected for site SD15 because it quickly and efficiently extracts gasoline-type contaminants from underground soils and groundwater. SD15 consists of four 30-feet by 50-feet concrete foundations used during the 1970s to

“For showing what imaginative and innovative people can do to provide excellent installations that strengthen the nation’s defenses, you have excelled in a continuing effort to provide the best possible places to work and live. I am pleased to recognize – OU5 Wetland Complex, 3rd Civil Engineer Squadron, Elmendorf AFB, AK”

-- William S. Cohen, Secretary of Defense, Commander In Chief’s Special Recognition For Installation Excellence Award - 1 May 1998

weather fuel filters and absorbent pads, and for the disposal of tank sludge. The data collected in 1999 shows that the contaminant removal rates are consistent and not dependent upon seasonal fluctuations. In 1999, the HVE system was optimized to increase the contaminant removal rate and prepare the site for closure. This system optimization resulted in the HVE system extracting over 155,923 gallons of groundwater and removing 8,710 pounds of volatile organic compounds. This system is scheduled to be shut down in FY2003.

Groundwater Modeling Effort/Natural Attenuation



Installing groundwater monitoring well

In 1993, the EPA, ADEC, and the AF agreed that all groundwater in the shallow aquifer upgradient of Operable Unit (OU) 5 would be assessed in the OU5 feasibility study and ROD. In support of this decision, a groundwater model was developed to meet the environmental conditions on Elmendorf. The primary objective of the model was to predict contaminant migration over a 30-year period and to determine if selected receptor points along Ship Creek would be impacted by groundwater contamination. Benzene and trichloroethylene (TCE) were selected as contaminants of concern indicators to be modeled.

The 1994 groundwater modeling report predicted that benzene and TCE plumes will continue to migrate south from upgradient areas and may temporarily increase in OU5, but will gradually decrease to below the maximum contaminant level by FY2014. Natural attenuation, a range of physical and biological processes that reduce the concentration, toxicity or mobility of contaminants, is generally relied upon to attain cleanup levels in the contaminated shallow aquifer. Institutional controls prohibit use of the shallow aquifer and ensure people will not be exposed to contaminated groundwater.

The basewide groundwater monitoring program began in 1994, and 123 monitoring wells are currently sampled on a semiannual basis. The objectives are:

- Evaluate overall groundwater quality status and trends and describe resource impacts
- Identify any new or unsuspected contaminant releases and provide early warning for increased contaminant levels or contaminant plume migration toward receptors
- Validate predictions made during groundwater modeling



Collecting groundwater samples at OU5

Based on 1998 groundwater monitoring data, benzene and TCE concentrations at OU5 agree with model predictions, although new spills and sources may impact the time required for natural attenuation of benzene.

Fast Track Cleanup

The restoration team is applying lessons learned from successfully cleaning up WWII contaminated sites to form the groundwork for cleaning up any future spills. We have successfully partnered with the ADEC to develop a "presumptive remedy" approach for groundwater cleanup of future spills. Existing groundwater modeling and monitoring, natural attenuation, and cleanup of contaminated groundwater in Elmendorf's award-winning engineered wetland system form the basis for this innovative approach to cleaning up fuel spills, resulting in considerable manpower and cost savings not only to the Air Force, but also to ADEC.

[ST41 Treatment System Shutdown](#)

Dynamic teamwork with environmental agencies, the RAB, and the community allowed for the shutting down of the ST41 groundwater treatment system, 11 years early, at a cost savings of \$1.1 million. Once identified as the worst contaminated site in Alaska by ADEC, ST41 is the location of four one-million-gallon underground storage tanks. These tanks were built in early 1942 and removed from service in 1990 because they were suspected to be leaking. In 1993, a groundwater treatment system (pump and treat) was installed to recover floating product at a cost of \$1.7 million. Annual operating costs averaged \$100,000 (\$1.80 per 100 gallons of water treated). These tanks were cleaned and filled in place in 1996. By 1998, all recoverable floating product had been collected, and the system was no longer recovering fuel. In 1998, the restoration team decided to shut this system down and allow groundwater cleanup to be completed by natural attenuation. This site is currently targeted to reach cleanup goals in FY2017.

[SS21 PCB-Contaminated Soil Removal](#)

During a 1998 removal project, over one million pounds of PCB-contaminated soil were excavated, containerized, and shipped to an EPA-approved site in the continental United States. The PCB-contaminated site was a former transformer storage site in the 1950s and 1960s. This project was successfully completed on time and on budget by a small disadvantaged 8(a) business. Successful removal of PCB contamination allowed for final closure of OU3 and resulted in the future unlimited use of the property.

[OT82 Site Investigation/Drum Removal](#)

OT82 was discovered while performing on-site verification of an aerial photographic reconnaissance study looking for potential new sites. This site consisted of a long, low bluff covered with approximately 1,000 55-gallon drums and other debris. The most problematic area was a large pile (12 cy) of asbestos insulation.

Upon discovery of the debris, the restoration team placed the site off-limits by posting “keep out” signs. Because children from nearby base housing were seen playing in this area, a town meeting was held. During the meeting, we informed the residents about the hazards, advised them to stay out of the area, and described the cleanup plans. Within 6 months of discovery, an expedited cleanup removed drums, metal, and asbestos. This site is now designated as a base recreational area.



Asbestos removal at OT82

[Engineering Evaluation/Cost Analysis \(EE/CA\)](#)

The cleanup process at two recently discovered sites with non-petroleum related contamination was expedited by conducting an EE/CA rather than following the procedures outlined in the FFA. The normal procedures under the FFA require an intensive remedial investigation/feasibility study (RI/FS) to be completed before cleanup. Working with EPA and ADEC, we expect to complete the EE/CA 18 months in advance of the typical RI/FS procedure at a cost savings of \$3-4 million. Accomplishment of these projects will allow Elmendorf to meet the EPA definition of “construction complete” in FY2005.

[Bioventing Systems](#)

In the mid-1990s, Elmendorf constructed 22 bioventing systems as a cost-effective presumptive remedy. Data collected annually reveals that bioventing is enhancing bioremediation of hydrocarbons in vadose-zone soils at Elmendorf. Soil sampling in 1999 confirmed dramatic decreases in petroleum hydrocarbons since the bioventing systems were installed. We expect cleanup of soil contamination by FY2006.

[Underground Storage Tanks](#)

A goal of the Elmendorf environmental programs is to not only meet the letter of the law, but to take full advantage of every opportunity to reduce unnecessary risks. An example of meeting this goal is Elmendorf’s efforts to remediate contaminated soil and upgrade fuel storage tanks. To meet 1998 EPA and ADEC requirements, Elmendorf removed approximately 200 fuel tanks. Nearly one-third of these tanks had associated subsurface petroleum contamination requiring extensive site characterization and subsequent corrective actions. During the course of the removal project the Elmendorf team initiated a review of the need for replacement tanks. As a result of the program



Removal of emergency generator underground storage tank

Elmendorf determined that only 50 tanks out of the original 200 needed to be replaced to maintain the same level of operational readiness. This reduction in tanks reduced both costs and risk to the environment.

All underground storage tanks on Elmendorf are in compliance with the new federal and state requirements. ADEC recognized Elmendorf in this substantial achievement.

Partnerships Addressing Environmental Cleanup Issues Between DoD and Other Entities

Elmendorf recognized in the early 1990s the importance of developing partnerships with regulatory agencies, local government, and the community. Early in 1992, Elmendorf implemented an interactive Community Relations Program considered a model by EPA Region X. An aggressive community outreach program involves and educates stakeholders in restoration and other critical environmental activities, assuring community support for all environmental programs. Strong teamwork with EPA and ADEC allowed Elmendorf to sign all of its RODs without the typical delays associated with this program.

Community Outreach

“Completing the recent five year review process was mainly due to the excellent working relationship between the State, US EPA, and the Air Force. While the agencies have had their occasional disagreements, this team working together is able to come to mutually agreeable decisions in which everyone wins.”

-- Jennifer Roberts, DoD
Program Manager, ADEC

Aggressive community outreach programs at Elmendorf involve and educate the public in restoration and other critical environmental activities. These programs are designed to promote general public awareness, while obtaining stakeholder feedback. Elmendorf actively seeks stakeholder feedback by attending community council meetings in neighborhoods adjacent to the base and sharing environmental information with fellow coordinators. Through membership in a local network of environmental public involvement professionals, ideas, successes, and environmental concerns are shared.

“With the rigorous demands operating in such an environmentally-sensitive location, your PA staff’s use of multiple communication tools showcased the Air Force as a community partner and responsible steward of public resources. Their community outreach efforts were key in building public trust and support, a critical element for successful operations.”

-- Col Ronald T. Rand, USAF, Director of Public Affairs, 1998 Air Force Public Affairs Director’s Excellence Award for Community Involvement in Environmental Planning

Elmendorf’s Web Page - We are developing a web page that currently contains information on RAB participation opportunities and locations of two information repositories. Environmental news releases are displayed and archived on the Public Affairs page of the site. As the web site evolves,

Elmendorf envisions including quarterly progress reports, fact sheets, maps, descriptions and status of restoration sites, institutional controls, treatment systems, and other information. The web page broadens public participation in the environmental process.

Kiosks - Strategically placed interpretative kiosks at high visibility locations explain various cleanup efforts. One kiosk, adjacent to a popular bike and snowmachine trail, explains how buried asphalt under the site was recovered and recycled. Near the engineered wetland, three panels of text and photos explain the construction and workings of this system. Other kiosks describe the natural attenuation process and the story of ST41.

Quarterly Progress Reports/Fact Sheets - Quarterly progress reports and fact sheets are routinely prepared to provide an up-to-date status of the Restoration Program. These documents are shared with the interested public, RAB members, and agencies. They are available for viewing, along with other restoration documents, at Elmendorf's two off-base information repositories.

Partnership In Education - Elmendorf takes an active role in supporting education in the local schools. Environmental staff frequently participates in classroom presentations in recycling, composting, water quality, restoration activities, and other environmental science subjects. We visit an average of 25 classrooms per year.

Open House/Air Show - The Environmental Flight participates in the base's annual open house and air show. Information pertaining to cleanup technologies, spill response, natural resource conservation, and pollution prevention is showcased. In 1999, when 50,000 people attended the show, displays included hands-on demonstrations of absorbent fuel booms, composting with worms, and tree planting information.

Tree Planting - The Elmendorf Conservation and Planning Office staff have focused on increasing use of volunteers to accomplish projects. Local Boy Scout troops have provided considerable support to natural resource conservation efforts on base. Boy Scout troops have accomplished many projects that not only assist the base in accomplishing its natural resource conservation objectives, but also fulfill the community service project requirement for Life Scouts working to achieve their Eagle Award in the scouting program. A most notable accomplishment has been the gathering of spruce cones for seed removal, followed by an aggressive reforestation effort of areas where timber has been harvested.

[Restoration Advisory Boards](#)

Elmendorf's award-winning RAB, now in its sixth year, expanded its focus to include the other branches of the Environmental Flight and now operates more like a community advisory board. Members are still advised about and asked to comment on restoration issues. The majority of the cleanups are well underway; therefore, the RAB reviews projects sponsored by pollution prevention, environmental quality, and natural resources staff. The RAB plays a key role in the development and implementation of Elmendorf's Environmental Investment (ENVVEST) clean air initiative. Elmendorf is one of two bases in the Air Force using ENVVEST as a process for improving air quality through investment in pollution prevention technology. ENVVEST is

currently projected to save \$1.5 million in administrative costs.

RAB Orientation Manual -

Elmendorf stepped out in a leadership role in PACAF in the development of an orientation manual for RAB members. The manual provides information specific to Elmendorf RAB membership duties, characteristics of the cleanup effort, points of contact, community relations efforts, risk assessments, restoration budget, site maps, and obtaining technical grants. This manual was well received and will be used as a training guide for future RAB members.

“Your team’s efforts to meet this challenge have reaped great benefits for our nation by building a partnership founded on a new approach to environmental stewardship. The partnership you’ve forged in the ENVVEST Initiative at Elmendorf is truly a template for environmental stewardship in the new millennium – a template for applying tax dollars more effectively and efficiently to reduce risks to human health and the environment.”

-- Thomas W.L. McCall, Jr., Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health)

RAB Summer Tours - A base tour featuring restoration sites, cultural and natural resources sites, and pollution prevention facilities is provided to RAB members each summer. These tours are a big hit with RAB members, who often bring along family members and visitors to Alaska.



RAB members tour PL81

The restoration team provided individual tours for members who wanted to see specific sites or who missed the summer tour. Tours of the engineered wetlands and other sites were highlights of visits by the Arctic Military Environmental Cooperation Meeting and by other national and international distinguished visitors in the ensuing years.

Other RAB Memberships -

Members of the restoration team participate in both the Fort Richardson and Anchorage Fuel

Terminal RABs. Our involvement provides Air Force input and perspective, as well as demonstrating concern for the Anchorage ecosystem.

[Government-to-Government Coordination with Alaska Natives](#)

Elmendorf has been proactive in establishing a close working relationship with local Alaska Natives who inhabited the area prior to the construction of Elmendorf during WWII. The base assembled a working group of native elders from nearby villages during the installation’s archaeological survey in 1993. This group, commonly referred to as the Dena’ina Team, was instrumental in assisting the base in identifying cultural sites under the protection of the Archaeological Resources Protection Act.

Close coordination with village elders to identify archaeological sites prevented possible damage and assured native stakeholder support to the ongoing beach cleanup work at LF04. Seasonal fish camps, where natives went in the summer to gather and dry fish as a food staple, are located in the vicinity of what is now the LF04 landfill. We consulted the Dena'ina Team to ensure beach cleanup work did not disturb these historic fish camps and possible burial sites.

Senior wing leadership encourages native participation in environmental program activities to ensure tribal interests are considered. Native membership has been actively solicited since the establishment of the RAB.

[Department of Defense and State Memorandum of Agreement \(DSMOA\)](#)

The DSMOA Cooperative Agreement is an integral part of the cleanup of DoD hazardous waste sites. Our efforts working with ADEC have contributed to increased efficiencies and cost savings, while maintaining the program goal of safely expediting environmental cleanups. Our cooperative effort with ADEC, to include mutual consideration of each other's comments and program objectives, is the key to cost-effective and timely execution of the Environmental Restoration Program.

Opportunities For Small and Small Disadvantaged Businesses In Environmental Cleanup

Elmendorf has embraced the use of small and small disadvantaged businesses. Approximately \$2.4 million in restoration projects have been awarded to three locally-owned small disadvantaged businesses. Bristol Environmental, an Alaska Native-owned firm, performed groundwater monitoring activities and operated various treatment systems. Oil Spill Consultants successfully excavated more than 1 million pounds of PCB-contaminated soil. Weldin Construction, a woman-owned 8(a) business, removed 11,000 feet of abandoned pipeline damaged in the 1964 Alaska earthquake. For this effort, Weldin Construction won the Minority Small Business Person of the Year Award and the Administrator's Award for Excellence in FY1998.

Reducing Risk To Human Health and The Environment

The restoration team has aggressively pursued reducing risk at contaminated sites, demonstrated by the SS21 PCB-contaminated soil removal, shut down of the groundwater treatment system at ST41, and the asbestos and metal debris removal at OT82. The construction and operation of the ST37 wetland complex, as the safety net in our groundwater cleanup program, prevent contaminants from reaching a major urban salmon fishery. We approach all of our projects in a manner to reduce risk whenever possible.

Elmendorf has established institutional controls to ensure protectiveness of human health and the environment. To various degrees, all RODs have requirements for institutional controls at contaminated sites. These controls range from fences, to specific land use restrictions, to the prohibition of the use of groundwater from the shallow aquifer. Institutional controls have been

incorporated into construction designs for new projects and real estate leases to ensure security and enhance safety to personnel who might consider excavation in a contaminated site. Special procedures have been adopted to review civil engineer work orders and work clearance requests to ensure compliance with these institutional controls. This process allows for the protection of remediation systems and monitoring wells from damage during construction activities. Overall, the institutional controls have enhanced environmental awareness while preventing further expansion of existing contamination.

Elmendorf recognizes the goal of the program is to reduce risk and the job is not done when the RODs are signed. We are continually reevaluating the effectiveness of remediation treatment systems and threats to the environment. For example, at LF04 there may be other approaches to improve effectiveness of cleanup actions while reducing risk. We are facing enormous challenges in dealing with LF04 -- extreme tides, sea ice, and treacherous mudflats. Until cleanup goals are achieved, our innovative institutional controls protect human health and the environment and support the 3rd Wing's mission. Proactive cleanup efforts contribute to increased military personnel morale and welfare and maximizes the usable land base available for future expansion -- critical components to military readiness.